

The Columbia Mishap

A dramatic photograph of the Space Shuttle Columbia during its ascent. The shuttle is oriented vertically, with its white orbiter and external tank and solid rocket boosters clearly visible. A massive, bright plume of fire and white smoke billows from the base, partially obscuring the lower part of the vehicle. To the left, the skeletal structure of the launch pad service structure is visible against the dark sky. The shuttle's nose is pointed towards the top of the frame, and the word "USA" is visible on the side of the orbiter.

An interview with RDML Steve Turcotte

RDML Turcotte commanded the Naval Safety Center until August 2003. He was a member of the NASA *Columbia* Accident Investigation Board, and currently is Commander, Naval Region Mid-Atlantic.





How did you become a member of the Columbia Accident Investigation Board?

After the *Challenger* accident [on January 28, 1986], a standing investigation board was created, replicating the Navy's squadron mishap-investigation-board process. Representatives were selected from the Navy, Air Force, FAA, DOT's National Transportation Safety Board, and NASA's Ames Research Center. The board meets once a year for a training exercise. Right after the *Columbia* accident, the board was convened and Adm. Gehman was selected to chair the board. The investigation team ended up including approximately 120 people. The expertise of the people involved was incredible.

What were your responsibilities on the board?

We stated our preferences to Adm. Gehman. I asked to head up the maintenance portion of the investigation. I have had an extensive maintenance background through my operational experiences in naval aviation, and I felt this aspect of the mishap was going to represent a significant part of the final report. I spent my time commuting between Houston and Cape Canaveral, walking the floors and communicating with the engineers responsible for the different shuttle maintenance programs.

Secretary of Defense Rumsfeld has recently set a DOD-wide goal to reduce the aircraft-accident rate by 50 percent in the next two years. One of the primary causal factors revealed in the Columbia Accident Investigation Report was that of a culture at NASA that helped to spawn the events leading to the mishap. Did your work on the board give you any insight into

how Secretary Rumsfeld's goal could help to be achieved by changing the culture of naval aviation?

I think we do a lot of things right in naval aviation and we really need to give ourselves a pat on the back. It took only a short time to realize that there were some serious communication issues going on at NASA between the engineers and the senior management. In naval aviation, when an aircraft is designed and built, the engineering process does not end there. Every time something goes wrong with a naval aircraft, it is well-documented and new procedures are put in place to deal with those engineering problems on a continuous cycle based on operational data. The same is not always true at NASA. The engineering analysis did not always keep pace with the operational deficiencies of the shuttle program. NASA lived in a world of extrapolated physics versus realistic physics. A problem at NASA would surface, the problem would be fixed, but then no system was put into place to ensure that problem was reevaluated periodically. From the professional engineers at NavAir all the way down to the Sailor carrying their individual MRC [maintenance requirement cards], naval aviation is well ahead of NASA in that respect. We don't rest on design criteria to ensure that systems are operating correctly. Another important observation I took away from the investigation is there needs to be a more inclusive Safety Center relationship with naval aviation to make sure the lessons we learn from maintenance and operational anomalies are communicated to the fleet.

Earlier this year, VAdm. Malone sent out a "Personal For" message to squadron commanding officers, asking for ideas on how to improve the Navy's accident rate. One of the require-

ments resulting from this message was the mandatory participation of Navy squadrons in the Naval Safety Center's culture-workshop program. Did your work on the Columbia Accident Investigation Board influence your opinion on the potential effectiveness of this program for Navy and Marine Corps squadrons?

My second big take-away from the investigation process was the necessity for more hands-on intervention at the leadership level, and I believe that the culture workshop is the ideal tool to support this requirement. NASA lived in a "we've been doing it like this for years" safety culture. The knowledge of system deficiencies was right in front of them, but they could or would not see it. Squadrons can sometimes be caught up in this same type of thought process. There are warning signals all around, but nobody acknowledges them until it is too late. The culture-workshop program takes an experienced set of trained eyes from the outside and provides an intervention process for the CO to make sure that those hazards are identified and acted upon before they become mishaps.

The culture workshop's foundation statement reads: "Operational excellence is built on a foundation of trust, integrity and leadership, created and sustained by effective communication." Did any of these pillars of safety break down and allow the Columbia accident to occur?

I can give you an excellent example of integrity. At NASA, senior engineers were making go/no-go decisions on systems they were not technically qualified to make. These individuals were swayed by senior NASA management's desire to keep the program on schedule. It was like making a junior officer the CO. Risk decisions were not only made at the wrong level, but unqualified individuals were making them. This resulted in a terrible breach of integrity in the engineering decisions



made at NASA. As for trust, a leader has to always know whom they can and cannot rely on for good advice. I sometimes use the old ploy of asking a question I already know the answer to. If I get an honest reply, then I know I can trust that person in the future. If the reply is less than sincere, then I know that individual needs further guidance. Leadership is the overall key to how a squadron operates. Commanding officers must realize they are always being looked at and emulated. A commanding officer's attitude and actions will ultimately decide the direction that a squadron takes.

Naval aviation meets all of the criteria of a "high-reliability organization," operating high-risk technology and relying on design and management to compensate for inevitable human shortcomings, thereby avoiding mistakes that under other circumstances would lead to catastrophe. The Columbia Accident Investigation Report states, "NASA and the space shuttle program must be committed to a strong safety culture: a view that serious accidents can be prevented, a willingness to learn from mistakes, from technology, and from others, and a realistic training program that empowers employees to know when to decentralize or centralize problem-solving. The shuttle program cannot afford the mindset that accidents are inevitable because it may lead to unnecessarily accepting known and preventable risks." Does naval aviation's "can-do" culture create an atmosphere where no one person wants to say "no" and therefore leads our pilots and Sailors to unnecessarily accept known and preventable risks?

The "can-do" spirit is the cornerstone of naval aviation and we should never give that up. However, "can-do" is not a stand-alone ethos. It must be tied with operational risk management to ensure that the reward is worth the risk. And we should never punish a "can't-do" answer. We need to continually educate our pilots

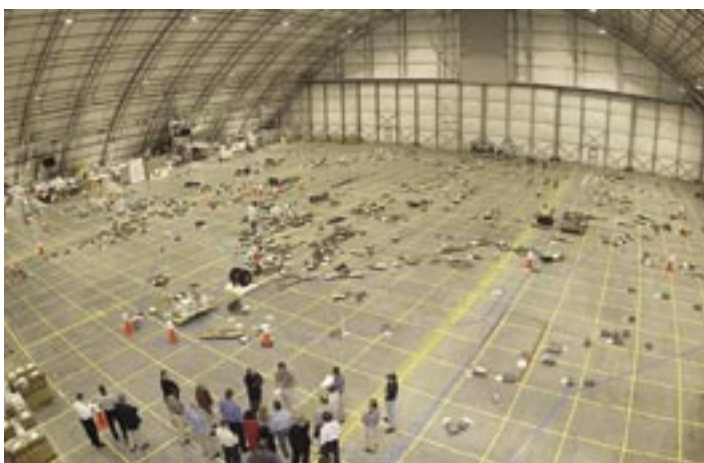



Photo by Rick Stiles

and Sailors that “can-do” needs support, and the risk management process is the perfect support structure for the “can-do” spirit.

The goal of the culture-workshop program is to provide commanding officers an outside “hazard identification” tool to satisfy step one of the five-step ORM process. The Navy has been learning about and using ORM for several years. Does this process hold more promise to achieve mishap reductions?

It has to. Risk management is the future of naval aviation safety. From the squadron commanding officer to a junior airman, all individuals must be able to identify the hazards that are present and work their way through the ORM process. We must allow for failures and plan for them. Often, the smartest people are the hardest to change. During our NASA investigation, the young engineers accepted the board’s recommendations much more easily than the seasoned veterans. In a squadron environment, commanding officers have to realize the best ideas may not always come from the most senior people. Lines of communication must stay open so the voice of the junior airman can be heard, as well as that of the department heads.

Naval aviation has been on a mishap-rate plateau for a number of years now, hovering between one and two class A mishaps per 100,000 flight hours. After serving as commander of the Naval Safety Center and being a member of the Columbia Accident Investigation Board, what do you see naval aviation needing to do to break through this barrier?

Three processes at the Safety Center can help bring down the accident-mishap rate. The first is our work with the School of Aviation Safety in Monterey through their maintenance climate assessment survey (MCAS) and the command safety assessment (CSA) automated questionnaires. These provide a good litmus test for squadron commanding officers to see if there are any potential problems in the squadron. The MCAS especially provides an unadulterated opinion from the junior airman. Secondly, the Safety Center’s safety-survey program gives insight to the technical issues facing a squadron, ensuring all of the important programs are crossing their “i’s” and dotting their “t’s.” The Safety Center has some very professional and experienced people who support the safety-survey process. They can identify the squadron’s technical strengths and weaknesses quickly and efficiently. The final process that the commanding officer needs to take advantage of is the culture-workshop program. These folks come in and do a “non-inspection” evaluation of the squadron in an operating environment, and provide the skipper a snapshot of the culture through a set of well-trained and experienced eyes. If each individual skipper uses these tools effectively, naval aviation should be able to break through the current plateau. 

The interview was conducted by Capt. George Platz, LtCol. Rick Boyer, USMC, and Derek Nelson of the Naval Safety Center